

2. For all channels added to CPSTs between January 1, 1995 and December 31, 1996, an operator may not increase the monthly per subscriber charges, for non-programming costs, by more than \$1.20. The \$1.20 is the *operator's cap*.
3. An operator may use any portion of the operator's cap to pay for programming costs. In addition, an operator may charge an additional amount of programming costs to subscribers during the first two years. This additional amount is limited to \$0.30 for new channels added to CPSTs. The \$0.30 is the *license fee reserve*.<sup>5</sup> Thus the total increase in the monthly per subscriber charges for CPSTs cannot exceed \$1.50 over the period from January 1, 1995 through December 31, 1996. This \$1.50 includes both amounts due to application of the per channel adjustment factor (i.e., the \$1.20 operator's cap) and amounts due to application of the license fee reserve.
4. Finally, in the third year of the three-year period, the operator's cap rises by \$0.20 to a total of \$1.40. Hence, the increase in the monthly per subscriber charges for CPSTs, for non-programming costs, cannot exceed \$1.40 over the three-year period. The license fee for the channels added in the third year will be subject only to the Commission's general rate rules, and will not be constrained by the license fee reserve.

In this Appendix, we present the data and analysis we used to inform our choice of the specific numerical values of: (1) the per channel adjustment factor, (2) the operator's cap, and (3) the license fee reserve. The rationale for the addition of a seventh channel in the third year is discussed in the section on the operator's cap. In addition to describing the data and methodology employed by the Commission in its own study, this Appendix also reviews the studies submitted to the Commission by commenters filing in response to the *Fifth Notice of Proposed Rulemaking* in MM Docket No. 92 - 266. We review the studies submitted by outside parties and describe the approach taken by the Commission for each of the key variables in the price cap structure.

## 1. THE PER CHANNEL ADJUSTMENT FACTOR

The per channel adjustment factor is the maximum permitted rate increase (for non-programming costs) for each channel an operator adds to its system's CPSTs. The adjustment factor reflects the cost that an operator facing effective competition would incur.

There are two possible approaches to estimating the adjustment factor. One is to construct the number directly from cost data. The other approach is to estimate the competitive costs. In its current rules, the Commission takes a hybrid approach: programming costs are granted external cost treatment, while other costs are included in the per channel

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<sup>5</sup> If six channels were added in the first two years, the average programming costs per channel would be \$0.05.

adjustment factor based on our examination of operator behavior. Commenters generally supported some variant of our hybrid approach.<sup>6</sup>

We believe that this hybrid approach serves the public interest. It avoids the administrative costs of conducting a full study to identify all costs, while ensuring that the parameters of our rules are empirically based, and serves both to protect consumers and to encourage systems to add channels.

As stated in the Order, we are convinced that for most cable systems our current per channel adjustment factor (based on a cross-sectional analysis of the Commission benchmark survey data) is too small. As a result, the current factor does not create sufficient incentives for adding new channels. Several programmers that submitted comments urged the Commission to provide increased incentives to cable systems. These commenters told us that our 7.5 % markup scheme disadvantaged new services, which generally had minimal or no license fees. The commenters also said that the 7.5 % mark-up did not cover the costs incurred to add new channels.<sup>7</sup>

Out of concern that the current per channel adjustment factor is too low to provide adequate incentives for most systems to add channels, we re-estimated the value of the per channel adjustment factor. In their comments, three parties proposed specific methodologies for determining some or all of the numerical values in the Commission's price cap structure. These parties are: Tele-Communications, Inc. (TCI), the National Cable Television Association (NCTA), and Continental Cablevision, Inc. (Continental). We begin by reviewing and evaluating the two studies submitted by TCI and NCTA, since they are based on the same general approach that we followed. We then describe our own study. Finally, Continental's proposal, which takes a different approach, is discussed.

As do the TCI and NCTA studies, we examined rate changes associated with channel changes in a sample of systems between two points in time. It is appropriate to examine changes over time because the price cap structure applies to changes in the number of channels over time. Thus, our time-series approach is more appropriate than a cross-sectional approach, which would examine differences among systems at a point in time rather than changes over time.

We estimated the per channel adjustment factor using publicly available data and commonly accepted statistical techniques. We drew a sample of 500 systems that is

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<sup>6</sup> See, however, Sammons Communications, Inc., Reply Comments in Response to Fifth Notice, at 19.

<sup>7</sup> NCTA Comments on Fifth Notice at 7 - 8; Cable Telecommunications Association Comments on Fifth Notice at 2 - 3; Cablevision Industries Corp. (CVI) Comments on Fifth Notice at 5 - 6.

representative of the systems that have insufficient incentives to add channels under our current rules. Although our sample is statistically valid, there are also other statistically valid samples. Differences between data sources and statistical techniques yielded different estimates of the elements of our formula. The estimates provide upper and lower bounds within which the exact value of the per channel adjustment factor lies. Having estimated these bounds, the Commission exercised its discretion to choose the value of the per channel adjustment factor that will best achieve the policy goals of the 1992 Cable Act.

Our basic methodology in examining the per channel adjustment factor was to estimate the current cost of adding a new channel under competitive conditions. It was not possible to observe these costs from current data, since comprehensive industry cost data are not available.<sup>8</sup> Therefore, we estimated the cost of a channel addition from historical data. We first recognized that the historical data that were available to us were in the form of rates or prices charged, rather than in the form of costs. To go from rates to a system's costs of adding a new channel, we adjusted the data for inflation, market power, and programming costs. This approach can be explained in terms of the generic per channel adjustment equation as shown below:

$$\text{per channel adjustment factor} = \frac{(R_2 - R_1)}{(N_2 - N_1)} \times MPA - \frac{(LF_2 - LF_1)}{(N_2 - N_1)}$$

where,

$R_2$  = Subscriber-weighted average monthly rates in year 2 for all relevant tiers, adjusted to 1994 dollars.

$R_1$  = Subscriber-weighted average monthly rates in year 1 for all relevant tiers, adjusted to 1994 dollars.

$N_2$  = Subscriber-weighted average number of channels in year 2.

$N_1$  = Subscriber-weighted average number of channels in year 1.

MPA = Market power adjustment.

$LF_2$  = Average monthly programming cost per subscriber in year 2, adjusted to 1994 dollars.

$LF_1$  = Average monthly programming cost per subscriber in year 1, adjusted to 1994

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<sup>8</sup> *Second Order on Reconsideration, Fourth Report and Order, and Fifth Notice of Proposed Rulemaking (Second Reconsideration Order)*, MM Docket 92-266, 9 FCC Rcd. 4119 (1994), at para. 107.

dollars.

The variables in the per channel adjustment equation are expressed above in general form. To make them more specific, several choices are necessary. We now explain the key choices behind each variable. Differences among the TCI Study, the NCTA Study, and our own Cable Services Bureau Study generally reflect different choices about how to measure the key variables in the per channel adjustment factor equation.

The key choices that determine the per channel adjustment factor are as follows:

- (1) the data set, including: the period covered, the tier or service used to count channel additions, the type of channel additions counted, and the weighting scheme;
- (2) the inflation index;
- (3) the market power adjustment (MPA); and
- (4) the method of estimating programming costs.

To define the subscriber-weighted average monthly rates ( $R$ ) and the number of channels ( $N$ ), the key choices are the weighting scheme and the type of channels to be counted.  $R$  and  $N$  make up the first term of the equation:  $R_2 - R_1$  is the change in rates and  $N_2 - N_1$  is the change in number of channels. Thus, assuming an increase in the number of channels,  $(R_2 - R_1) / (N_2 - N_1)$  is the increase in rates per channel added.

The first adjustment made to the historical data was for inflation. The per channel adjustment factor is intended to cover the costs of adding a new channel. Since the rate data include price increases for inputs such as labor and materials associated with old channels, one must subtract these cost increases from the historical data. To adjust for such inflationary input price increases, a price index (e.g., the Gross Domestic Product Price Index or the Consumers' Price Index) is used.

Another adjustment was for market power. If an operator has market power, it is able to charge subscribers a price above the competitive cost for new channels offered. Thus, one must estimate the MPA and multiply  $[(R_2 - R_1) / (N_2 - N_1)]$  by the MPA. Since market power raises rates above competitive costs, the MPA is less than one, and this adjustment reduces the change in rates per channel.

The last term in the per channel adjustment equation accounts for programming costs (LF). These costs are subject to external cost treatment and thus should be excluded for purposes of setting the per channel adjustment factor. Since the observed monthly rates per channel include programming costs (e.g., license fees), these costs must be deducted from our estimates. To adjust the change in rates per channel to remove programming costs, we must

compute the change in LF per channel added. The change in license fees per channel is defined as  $(LF_2 - LF_1) / (N_2 - N_1)$ .

Having described the per channel adjustment factor in general form, we next consider two commenters' studies that estimated this factor.

### The TCI Methodology

TCI used two data sources to estimate the per channel adjustment factor.<sup>9</sup> The following table lists the choices TCI made in their estimating procedure.

$R_2$	=	Subscriber-weighted average monthly rates in 1991 for the "most popular service", adjusted to 1994 dollars.
$R_1$	=	Subscriber-weighted average monthly rates in 1986 for the "most popular service", adjusted to 1994 dollars.
$N_2$	=	Subscriber-weighted average number of channels in 1991.
$N_1$	=	Subscriber-weighted average number of channels in 1986.
MPA	=	$0.83 = (1 - 0.17)$ = Market power adjustment
$LF_2$	=	Average monthly licensing fee per subscriber times number of satellite channels in 1991, adjusted to 1994 dollars.
$LF_1$	=	Average monthly licensing fee per subscriber times number of satellite channels in 1986, adjusted to 1994 dollars.

TCI used two different approaches to estimate the per channel adjustment factor. The key choices in the first approach are summarized in Table 1, row 1 (labeled TCI 1). One key choice was their use of GAO data. TCI used data from the 1986 and 1991 GAO cable rate surveys. The GAO surveys report average rates, total channels, satellite channels, and other variables for the most popular service and the lowest price service. TCI used the most popular service figures. The most popular service is defined by GAO as the one to which the most customers subscribe. It may be the basic tier or it may be basic plus expanded basic on

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<sup>9</sup> See *A Competitive Markup Approach to Establishing Rates When Adding Cable Program Services*.

different operators' systems.<sup>10</sup> TCI also estimated average monthly programming costs by multiplying the subscriber-weighted average costs by the average number of satellite channels.<sup>11</sup>

TCI derived its per channel adjustment factor as follows. First, TCI calculated changes in inflation-adjusted most-popular tier rates for the relevant time intervals. Second, TCI divided the rate changes by the corresponding change in the number of channels.<sup>12</sup> To adjust for market power, TCI then multiplied the per channel rate change by 0.83, reflecting the competitive differential that the Commission identified in its rate regulation proceeding. Then, TCI subtracted the estimated change in programming costs per channel added to derive a per channel adjustment factor of \$0.211 for the November 1986-April 1991 period. TCI refers to its first approach as the "same-cost method".<sup>13</sup>

As an alternative approach, TCI used the FCC benchmark data set to estimate the per channel adjustment factor. This second approach is summarized in Table 1, row 2 (labeled

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<sup>10</sup> During the relevant time period, basic service generally included local broadcast signals, PEG channels (public, educational, and government access channels), and some satellite channels. Expanded basic generally included additional satellite channels.

<sup>11</sup> TCI used subscriber-weighted top-of-rate-card cost estimates from Paul Kagan Associates, Inc. Because these numbers do not include discounts on programming, they overstate programming costs.

<sup>12</sup> For the 1986-1991 period, the GAO sample shows an identical average increase in the number of satellite and total channels. Thus, in this TCI study, the choice of the type of channels added did not change the per channel adjustment factor.

<sup>13</sup> TCI also used a "lower-cost method". The lower-cost method is implemented by calculating the change in inflation-adjusted rates per channel net of programming costs and then multiplying that difference by 0.83. The per channel equation would be:

$$\left[ \frac{(R_2 - R_1)}{(N_2 - N_1)} - \frac{(LF_2 - LF_1)}{(N_2 - N_1)} \right] \times MPA \quad (\text{Lower-Cost Method})$$

Since the change in per channel license fees was adjusted by the MPA (which is less than one), the programming adjustment is smaller under the lower-cost method. This smaller adjustment yielded a per channel adjustment that is 5 cents higher than the same-cost method, \$0.26 rather than \$0.211. The lower-cost method is based on the assumption that programmers can extract a significant share of cable systems' profits. We find this assumption to be less plausible than the assumption that programming costs do not differ systematically between competitive and non-competitive cable systems. We therefore used the same-cost method and obtained estimates of the per channel adjustment factor that are close to TCI's estimate.

TCI 2). TCI began with separate calculations of the inflation-adjusted annual rate change between November 30, 1986 and September 30, 1992 for each non-competitive system in the FCC benchmark sample. For each non-competitive system, TCI calculated a rate increase per channel added. These figures were combined with the same programming cost data used in the GAO data set calculations to derive the per channel adjustment factor using the same-cost method. The per channel adjustment factor under this method is \$0.30.<sup>14</sup>

Although we believe TCI's overall methodology is reasonable, both of TCI's approaches have shortcomings. The first approach does not properly estimate the costs of adding new channels to the system. It does not adequately distinguish between adding a new channel and switching an established channel from one tier to another. TCI started with monthly rates from the GAO surveys for the most popular service in 1986. Between 1986 and 1991, however, the most popular service changed because of tier restructuring. Tier restructuring involves the movement of channels between tiers, not the addition of new channels to the system. Yet, the price cap structure relates only to new channels added to an operator's system. Hence, GAO data on the most popular service give an inaccurate picture of the number of new channels added to an operator's system. Failing to account for such restructuring can bias the estimates of the per channel adjustment factor.

The tier restructuring problem inherent in the GAO data is not easily corrected. GAO data on cable rates are based on types of services offered rather than on specific tiers of service. Hence, use of GAO data for estimating the cost of adding a channel to a tier would require converting service-based rates to tier-based rates. The information needed to do this conversion is not available.

In its second study, TCI applied its methodology to data from the FCC benchmark survey. While this second study does not suffer from the tier restructuring problem, it is subject to a different limitation. TCI took a weighted average of rates across systems. This is single weighting. However, TCI did not also take a weighted average of rates across tiers within each system. Doing both types of weighting is double weighting. Both weighting schemes need to be considered. Each provides a useful check on the results of the other. TCI should have at least attempted the double-weighting scheme, and explained why it was not applicable.<sup>15</sup>

### **The NCTA Methodology**

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<sup>14</sup> TCI also used the lower-cost method with this data set. Using the lower-cost method, which applied the MPA to the change in per channel programming costs (see n. 11), resulted in a higher per channel adjustment factor of \$0.34.

<sup>15</sup> The difference between single- and double-weighting schemes is explained more fully below in the subsection *The Weighting Scheme*.

NCTA submitted a study that used data on municipal and overbuild systems from the FCC benchmark survey.<sup>16</sup> NCTA calculated a per channel adjustment factor ranging from 30 cents to 77 cents. The 30 cent estimate is the median and the 77 cent estimate is the average. NCTA's rationale for using this sample was that the systems met the statutory definition of effective competition, and thus the pricing of these systems represented competitive behavior.

The following table lists the choices NCTA made in estimating the per channel adjustment factor.

$R_2$	=	Average monthly regulated revenues per subscriber in 1992 for all regulated tiers, in 1992 dollars.
$R_1$	=	Average monthly regulated revenues per subscriber in 1986 for all regulated tiers, adjusted to 1992 dollars.
$N_2$	=	Number of channels in 1992 (total channels).
$N_1$	=	Number of channels in 1986 (total channels).
MPA	=	By selecting a competitive sample, NCTA removed the effect of market power.
$LF_2$	=	Average licensing fee per subscriber times the number of satellite channels in 1992, in 1992 dollars.
$LF_1$	=	Average licensing fee per subscriber times the number of satellite channels in 1986, adjusted to 1992 dollars.

Table 1, row 3 shows the NCTA choices. Unlike the first TCI study, the NCTA study avoided the problem of tier restructuring.

However, the NCTA study has two limitations. First, NCTA used data that pertain largely to a single year to estimate the per channel adjustment factor, which relates to changes over time. Because the benchmark data set is missing observations for 1986, NCTA could not properly use it to calculate changes in rates and number of channels between 1986 and 1991.<sup>17</sup> However, the benchmark data set contains sufficient observations for 1991 to estimate the competitive differential, which we used as our market power adjustment. As explained in the Commission's *Second Order on Reconsideration*,<sup>18</sup> the competitive differential is the

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<sup>16</sup> See *Going Forward Rules For New Channels*.

<sup>17</sup> While the benchmark survey requested 1986 and 1991 data, a poor response for 1986 data made the data set less useful for 1986-1991 comparisons.

<sup>18</sup> *Second Reconsideration Order*, at paras. 1 - 8.



average difference in rates between systems subject to effective competition and systems not subject to effective competition.

A second limitation of the NCTA study is the exclusion of compulsory license fees from estimated programming costs. Compulsory license fees are the royalty payments made by cable operators to copyright holders for retransmission of television broadcast signals. NCTA estimated programming costs using annual basic license fee data from Paul Kagan Associates. The per-subscriber license fee was obtained by dividing the annual fee by the number of basic tier subscribers which, in turn, was divided by 12 to get the monthly per-subscriber license fee. Next, the monthly per-subscriber license fee was divided by the number of satellite channels to get the average monthly license fee per satellite channel. NCTA calculated the programming costs of each of the 17 systems by multiplying the average monthly license fee per satellite channel by the number of satellite channels in each system. This method underestimates total license fees because it excludes the compulsory portion of the license fee. As a result of underestimating the license fee, the estimate of the per channel adjustment factor is too high.

#### **Cable Service Bureau (CSB) Study**

Our approach is similar to TCI's approach, with two exceptions. Whereas TCI used GAO's most popular service, we used all regulated tiers.<sup>19</sup> Also, we weighted our sample by the number of subscribers in each tier and by the number of subscribers for each operator. By contrast, TCI weights their sample by subscribers by operator. The CSB approach can be summarized using variables in the per channel adjustment equation as follows:

$R_2$  = Subscriber-weighted average monthly rates in 1991 for all regulated tiers, adjusted to 1994 dollars.

$R_1$  = Subscriber-weighted average monthly rates in 1986 for all regulated tiers, adjusted to 1994 dollars.

$N_2$  = Subscriber-weighted average number of channels in 1991 (total channels).

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<sup>19</sup> All regulated tiers include all tiers of service with the exception of tiers composed of:

- (1) Video programming offered on a pay-per-channel or pay-per-program basis; or
- (2) A combination of multiple channels of pay-per-channel or per-program video programming offered on a multiplexed or time-shifted basis.

See 47 C.F.R. §76.901.

- $N_1$  = Subscriber-weighted average number of channels in 1986 (total channels).
- MPA =  $0.83 = (1 - 0.17)$  = Market power adjustment
- $LF_2$  = Monthly licensing fee expenditures per subscriber in 1991, adjusted to 1994 dollars.
- $LF_1$  = Monthly licensing fee expenditures per subscriber in 1986, adjusted to 1994 dollars.

In the remainder of this section we spell out the Commission's approach in detail.

### **The Data Set**

In order to estimate the elements of the going forward rule structure, we considered three sources of data: the GAO *Survey of Rates and Services Offered by Cable Television Systems* (hereafter called GAO data set); the FCC's benchmark survey (hereafter called the benchmark data set); and data from the *Television and Cable Factbook* (hereafter called the *Cable Factbook* data set). We believe that the *Cable Factbook* is the best suited data set to estimate the elements of the price cap structure for three reasons.

First, the *Cable Factbook* data set includes data for each year for the 1986 to 1991 period. This time series allowed us to analyze changes in rates and in the number of channels. We used these changes to estimate the per channel adjustment factor. Because the benchmark data set is missing observations for 1986, we could not use it to calculate changes in rates and number of channels between 1986 and 1991.<sup>20</sup> However, the benchmark data set contains sufficient observations for 1991 to estimate the competitive differential, which we used as our market power adjustment.

Second, the *Cable Factbook* data set includes all tiers, and allowed us to identify new channel additions to each system. Thus, we could separate new channel additions from channels moved between tiers. This eliminated the problems caused by tier restructuring. As a result, our estimates of the per channel adjustment factor are correctly based only on new channels added to the system. Established channels that were switched from one tier to another did not affect our estimates of the per channel adjustment factor.

Unlike the *Cable Factbook* data set, the GAO data set did not allow us to distinguish new channel additions from channels switched between tiers. The data set contains rates only for the most popular service and the lowest price service. As noted above in our discussion of the first TCI study, the GAO data set could bias the estimated cost of adding a new

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<sup>20</sup> Although the benchmark survey requested 1986 and 1991 data, the response for 1986 was incomplete which made the data set less useful for 1986-1991 comparisons.

channel to a system.

Third, the *Cable Factbook* data set includes all large systems. This ensured that our estimate of the per channel adjustment factor achieves our goal of providing adequate incentives for systems to add channels. The existing rules allow for different per channel adjustments for large and small systems. However, the existing rules provide inadequate incentives for systems to add channels. Our new rules provide adequate incentives for small systems, such as the headend cost adjustment. When we estimated the per channel adjustment factor, we wanted to ensure that large systems also have adequate incentives. Thus, we used a data set that included all large systems.

Our sample of cable systems included 500 systems which were in operation both in 1986 and 1991. We used a stratified random sampling method to select our sample. We had nine distinct strata based on the number of subscribers on the system. Table 2 shows the composition of our sample. This sampling method weights systems with a larger number of subscribers and those with a smaller number of subscribers in proportion to their relative shares in the total number of subscribers in the industry. Accordingly, we included most of the top 200 cable systems. In addition, 31.92% of our sample is made up of systems with more than 50,000 subscribers. Weights for the remaining strata were in proportion to their percentage of the total number of basic tier subscribers in the industry as published in NCTA's *Cable Television Developments* booklet, dated April 1994.

The benchmark data set consists of a sample of cable service rates for 1986 and 1991. The rates are for all tiers: basic, extended basic, and all others. The data set consists of a random one percent sample of approximately 3,000 systems. There is no emphasis placed on large systems. In the data used to estimate the competitive differential rate adjustment, the sample includes only 16 of the 100 largest systems.

Appropriate to the task of formulating general going forward rules, which contain separate, specific provisions for small operators, we placed greater emphasis on larger system data over smaller system data. The record strongly suggests that small systems operate under different parameters than large systems and, as a result, have higher administrative and operating costs.<sup>21</sup> Our analysis avoids overestimating the cost of channel additions that would result from an oversampling of these higher-cost systems.

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<sup>21</sup> *Second Reconsideration Order*, at paras. 107, 117-118, 216. See also, Coalition of Small System Operators, Supplemental Information re: Programming Costs for Large Cable Operators Versus Small Operators (Feb. 15, 1994); Small Business Cable Association, Supplemental Comments in Further Support of Industry Benchmark Adjustments for Low Density and Smaller Cable Operators (Feb. 15, 1994) at 5-10.

### **The Time Period**

We estimated the per channel adjustment factor using Cable Factbook data on rates during the pre-regulation period (1986-1991). Cable systems were subject to rate regulation only by local franchising authorities between 1974 and 1984. The 1984 Cable Act deregulated the cable industry. By the end of 1986, deregulation was largely completed.<sup>22</sup> Moreover, we believe that a sufficient percentage of cable systems were deregulated by the beginning of 1986 for us to consider all of 1986 deregulated. Even before then, rate regulation by local franchising authorities was not fully effective.<sup>23</sup> Further, local franchising authorities could regulate only basic rates where effective competition was absent. Thus, extended-basic rates were not subject to regulation.<sup>24</sup> As a result, we consider 1986 as the start of the deregulation period before passage of the Cable Act of 1992.

We selected a deregulated period because we wanted to observe unregulated market behavior. Free of the influence of regulation, such data enabled us to estimate the competitive cost of adding a channel. This estimate provided the basis for the per channel rate adjustment factor. However, we could not observe costs directly. What we could observe were historical rates. We therefore looked at historical rates and adjusted them for market power to provide an estimate of costs.

### **The Weighting Scheme**

We considered two types of weighting schemes: (a) single weighting and (b) double weighting. Both schemes yielded subscriber-weighted averages for rates and for the number of channels. To obtain a simple (unweighted) average rate, one starts with rates by tier on each system for a given year. The tier rates are then summed and divided by the number of tiers to obtain the average rate for the system. The average rates are then summed for all systems and divided by the number of systems to obtain the average rate for all systems.<sup>25</sup>

To obtain a subscriber-weighted average rate, weights are applied based on the number of subscribers across tiers, systems, or both. A single weighting scheme weights only once,

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<sup>22</sup> The 1984 Cable Act took effect on December 29, 1984 (Public Law 98-549, 98 Stat. 2780, October 30, 1984, Sec. 9.) The 1992 Cable Act states that "...rates for cable television services have been deregulated in approximately 97 percent of all franchises since December 29, 1986." (Sec. 2,(a),(1).

<sup>23</sup> Rubinovitz, *Rand Journal of Economics*, Vol. 24, No.1, Spring 1993, pp. 6 and 16.

<sup>24</sup> Rubinovitz, p. 2, fn. 1.

<sup>25</sup> A simple (unweighted) average is sometimes referred to as an "equal-weighted" average because every term added to compute the average is given equal weight.

across either tiers or systems.<sup>26</sup> A double-weighting scheme weights twice, across both tiers and systems. In our study, we used a double-weighting scheme that weights across tiers by the number of subscribers on each tier, for a given system, and then weights across systems by the total number of basic subscribers on each system.

We selected double weighting because this method gives a more accurate picture of the experience of the largest number of subscribers on each system. This is desirable because the price cap structure can benefit more subscribers if it is based on the experience of the largest number of subscribers. For example, the double-weighting scheme first weights the individual tier rates by the number of subscribers on each tier. CPSTs are thus emphasized less than basic tiers, reflecting the fact that CPSTs have fewer subscribers. The double-weighting scheme then sums the subscriber-weighted tier rates for each system in a given year. Then, the double weighting scheme weights each system's rate for all tiers by the number of subscribers on the system. Finally, double weighting sums the subscriber-weighted rates for all systems. The resulting sum is a subscriber-weighted average rate for the year.

### **Adjustments to the Data Set**

We made three adjustments to the rates from the *Cable Factbook* data set. First, we adjusted the rates to remove the effects of inflation. Next, we computed observed changes in rates per channel added from one year to the next. Subsequently, we adjusted rate changes to remove the effects of market power. Finally we subtracted the monthly programming expense from the rate increases per channel added. The resulting adjusted rate increase per channel added provided our estimates of the per channel adjustment factor.

#### **Adjustment for Inflation**

This adjustment was made using the Department of Commerce's Gross Domestic Product Price Index (GDP-PI). We use the GDP-PI as an adjustment factor because it is a broad-based index that includes all goods and services, including those that cable operators purchase as inputs. In contrast, the Consumer Price Index (CPI) is more representative of the market of goods and services commonly purchased by households. The rates for each year were multiplied by the value of the 1994 GDP-PI inflator for the same year. This allowed us to express all the rates in 1994 dollars, thereby removing the effect of inflation.

#### **Adjustment for Market Power**

The exercise of market power was another reason rates increased between 1986 and 1991. Such rate increases were in addition to the costs of adding a channel incurred in a

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<sup>26</sup> TCI used single weighing by system in its studies. TCI also used "single weighing by tier" in which it weighted tier rates by the number of subscribers on each tier, for a given system, and then computed a simple average of these rates across all systems.

competitive environment. Consequently, we reduced observed monthly rates in non-competitive markets by the "competitive differential" found in the FCC's revised benchmark calculation.<sup>27</sup> This reduction was called for in the 1992 Cable Act, which sought to give cable subscribers the benefits of competition (i.e., reduced prices and improved service), when competition does not exist in their local market. The benchmark calculation estimated the average difference between competitive and noncompetitive rates at 17 %. Hence, we reduced the average monthly rate by 17 % to account for the exercise of market power. Failure to adjust the average rate for market power would overestimate the per channel adjustment factor.

Because it is an average, we applied the 17 % adjustment to all systems rather than estimating an individual adjustment factor for each system. We recognize that 17 % may be too large an adjustment for some systems and too small an adjustment for others. In addition, because 17 % was estimated using historical data on existing channels, it may differ from the market power adjustment for existing and newly added channels. Despite these qualifications, we believe that any errors introduced by the use of this market power adjustment do not have a significant effect on the estimates of the per channel adjustment factor.

#### **Adjustment for Programming Costs**

We considered two alternative measures of programming costs: "average" license fees and "compulsory plus basic" license fees. The average license fee represents license fees paid by cable operators for a majority of the top twenty cable channels. It takes into account volume discounts and other discounts received by cable system operators. We obtained the data for average license fees for the years 1989 to 1991 from the Paul Kagan Associates *Cable TV Programming* newsletter (April 1992). Annual average license fee data were converted to monthly data by simply dividing by 12. Since average license fees do not include all possible cable programming expenses, they underestimate the total programming expense incurred by an operator. To compensate for this underestimating effect, we used our second measure, the "compulsory plus basic" method.

Our second measure of programming cost, compulsory plus basic license fees, is made up of two parts. The basic portion of the license fee is actual programming costs incurred by operators. We obtained annual basic license fee data from Paul Kagan's *Cable TV Programming* newsletter (March 1992). These license fees are annual expenditures which operators pay to programmers for non-broadcast cable programming services. We then divided annual fees by the number of basic subscribers to get the per-subscriber rate, and then divided by 12 to get monthly data.

The second part is compulsory license fees. These are the semi-annual royalty

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<sup>27</sup> *Second Reconsideration Order* at paras. 76 - 105.

payments that each operator must make for retransmission of TV broadcast signals by its systems. We added compulsory license fee data to basic license fee data to obtain total programming costs incurred by operators. We converted annual compulsory license fee payments data from the U.S. Copyright Office, Library of Congress. We then converted annual data to monthly per subscriber data by dividing the annual compulsory license fee data by the number of basic subscribers and then by 12. All programming cost data were then adjusted for inflation using the GDP-PI. These two methods provided us with an upper and lower bound for estimating programming costs.

### **Estimates of the Per Channel Adjustment Factor**

To estimate the per channel adjustment factor, we calculated the change in monthly rates (net of programming costs) between 1986 and 1991 and divided by the change in the number of channels between 1986 and 1991. Because of differences in data sources and statistical techniques, the estimates we obtained can provide only an upper bound and a lower bound for the per channel adjustment factor. To obtain the upper and lower bounds, we varied the sources of programming costs.

Our estimates of the per channel adjustment factor are summarized in Table 3. The estimates in Table 3 were obtained using different data sources for programming costs. The first row in the table presents the results using basic plus compulsory license fees to adjust for programming costs. The second row presents the results using average license fees to make this adjustment. The columns in Table 3 show how the per channel adjustment factor is calculated. Column 1 shows the per channel change in average monthly rates. These rate changes are already adjusted for inflation and market power, and are divided by the change in the number of total channels. Column 2 shows the per channel change in programming costs. The estimated per channel adjustment factor is shown in column 3. It is calculated by subtracting the estimated programming cost per channel in column 2 from the per channel rate change in column 1.<sup>28</sup>

As shown in Table 3, our two estimates of the per channel adjustment factor are 21.9 cents and 18.7 cents.<sup>29</sup> The average of these estimates is 20.4 cents.

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<sup>28</sup> The estimates shown in Table 3 were obtained using data from 1986 and 1991. We checked these estimates by running a simple regression. The average number of channels was the independent variable. The average monthly rate was the dependent variable. We used data for each year between 1986 and 1991. Our estimates using data only from 1986 and 1991 do not differ significantly from our regression estimates.

<sup>29</sup> The derivations of these calculations are shown in Tables 4 and 5.

Within the lower and upper bound estimates of the per channel adjustment factor (18.7 and 21.9 cents), the Commission has exercised its discretion and selected 20 cents as the value that will best achieve the goals of the 1992 Cable Act. Based on historical experience, we believe that a 20 cent per channel adjustment factor will encourage systems to add new channels to their CPSTs, while at the same time protecting subscribers from excessive rate increases.

### **The Continental Cablevision, Inc. Methodology**

Before concluding the discussion of the per channel adjustment factor, we discuss the proposal of Continental Cablevision, Inc. Under the Continental proposal, the per channel adjustment factor was calculated separately for each system, equal to the system's average rate for all channels, net of licensing fees. Using this method, for example, a system charging \$12.00 per month for a 10 channel tier with \$2.00 in licensing fees would yield a \$1.00 per channel adjustment factor [ $\$1.00 = (\$12.00 - \$2.00)/10$ ].

Continental argues that its approach is reasonable since it uses rates established under the *Second Reconsideration Order*. As specified by the *Order*, these rates are adjusted downward by 17 % to eliminate the effects of market power. Although these rates may be competitive, there is a serious shortcoming with Continental's proposal. Continental calculated the average charge per channel for all channels rather than the average charge per channel for new channels added to the system. Consequently, Continental's approach failed to account for economies of scale in the provision of services and the likely declining incremental value to subscribers from incremental services. Thus, there is strong reason to believe that Continental's estimates of the per channel adjustment factor are too high. As a result of this shortcoming, we have decided not to adopt the Continental proposal.

## **2. THE OPERATOR'S CAP**

In this section, we describe the procedure for establishing the operator's cap, which limits the amount by which cable system operators may increase monthly per subscriber charges for non-programming costs when they add new channels to their CPSTs. We begin by reviewing why such a cap is necessary.

Where regulation under the 1992 Cable Act has pushed cable rates below their unregulated, profit-maximizing levels, systems under the new rules could have incentives to add low-value channels to regulated tiers to make up for the mandated price reductions, even when doing so raises the cost of programming more than the value of the added channels to subscribers.



Based on a study conducted by Charles River Associates (CRA)<sup>30</sup>, the NCTA recommended a cap of \$1.50 per year. The CRA study examined the historical increase in rates and found that the average increase in channels is approximately two channels per year with a corresponding increase in rates ranging from \$0.21 per channel to \$0.26 per channel. While ultimately accepting CRA's estimates, NCTA argued that the rate of channel additions between 1986 and 1991 was limited by a shortage of new programming. NCTA contended that the rapid growth in cable networks currently underway would result in systems adding new channels in excess of two per year in the future.

The underlying approach taken by the Commission in setting the operator's cap was to ensure that systems could continue to add channels at the same rate they did during the deregulated period. This was done by first estimating the historical pattern of channel additions. Then we calculated what operator's cap amount will allow systems to add that number of channels, while charging the per channel adjustment factor for each additional channel plus an allowance for programming costs.

This section focuses on estimating the historical rate of channel additions. There are several issues that we had to address in estimating this rate. For example, we had to consider the pattern of channel additions to ensure that average numbers are not misleading. To see this point, suppose that over a three-year period systems added an average of two channels per year. This average could be the result of each system steadily adding two channels per year. Alternatively, it could be due to two-thirds of the systems adding no channels in a given year, with the remaining one-third adding six channels that same year. Our approach to this problem is as follows. As a first step, we estimated the average rate of channel additions per year. Having found this average rate, we then looked at the distribution of systems whose historical pattern of channel additions fell within a cap based on three times the average rate. Based on the historical pattern of channel additions, we decided to allow systems the flexibility to offer the full complement of channels at any point in the next three years (that is, they will not be restricted by the one-year channel addition average in each year).

Possible changes over time may have affected the historical rate of channel additions. Potential factors include the end of regulation (which might have led to a temporary increase in the rate of channel additions as a "cover" for rate increases), changes in the number and quality of cable services available for systems to add, and the imposition of the must-carry rules.

In order to calculate the average rate of channel additions, as well as the range of channel additions, we had to select the proper sample. The key choices are the time period, the tiers included, and the nature of the channels counted. For the reasons given earlier, we find the time period from 1986 through 1991 to be reasonable for these purposes. In terms of

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<sup>30</sup> *Ex parte* letter from NCTA to Meredith Jones, Chief, Cable Services Bureau, FCC, Attachment 1 (October 13, 1994).

the tiers included, we considered two approaches. One is to include all regulated tiers. Alternatively, one could examine only those channels added to CPSTs. One could argue that historical additions to basic should not be included, given that the operator's cap does not apply to additions to basic. Nevertheless, we believe that the maturation of the cable industry makes it reasonable to project that future additions to CPSTs will be at a rate similar to the past rate of additions to all regulated tiers.

We decided to use total channels (satellite, broadcast, and local origination) to construct our estimate of the operator's cap. We made this decision so that the estimate of the operator's cap is consistent with our estimate of the per channel adjustment factor, which was estimated using total channels.<sup>31</sup> One could argue that the historical pattern of satellite channel additions better reflects the rate of channel additions to CPSTs. We recognize that in the future, channels added to CPSTs will primarily be satellite channels. Our choice to use total channels will not hinder the growth of satellite channels on CPSTs.

To obtain an upper and lower bound for the average number of channels added per year, we varied the weighting scheme. We estimated single-weighted and double-weighted changes in total channels.<sup>32</sup> Our estimates ranged from a single-weighted average of 2.3 channels added per year to a double-weighted average of 2.5 channels added per year. Thus, our estimate of the average number of channels added per year is 2.4. These annual rates correspond to an average of five channel additions over a two-year period and seven channel additions over a three-year period. These numbers influenced our thinking about recovery of costs of a seventh channel in the third year under the price cap structure.

For satellite channels, our estimates range from a single-weighted average of 1.9 channels added per year to a double-weighted average of 2.1 channels added per year. Since total channels added between 1986 and 1991 are slightly higher than satellite channels added, we are confident that our use of total channels to construct the operator's cap will not hinder the addition of satellite channels to CPSTs. If anything, it will better promote satellite channel growth on CPSTs.

In determining the operator's cap, the Commission recognized that the addition of channels is "lumpy". In other words, in any one year a cable system may add more channels than the average, but then refrain from adding channels, or add below the average number of

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<sup>31</sup> It was necessary to use total channels for all regulated tiers in order to solve the problem of tier restructuring and to accurately measure the rate impact of new channel additions.

<sup>32</sup> As discussed earlier, a double-weighting scheme weights channels by subscribers per tier as well as by subscribers per system. A single-weighting scheme weights channels either by subscribers per tier or by subscribers per system.

channels in a subsequent year.<sup>33</sup> Setting the operator's cap to promote channel additions at the historical average rate may be too restrictive. Systems that want to add more than the historical average in any one year may be discouraged from doing so. To avoid discouraging systems from adding new channels, we set the operator's cap at a level that would provide enough added revenue to encourage channel additions at the historical average rate.

Accordingly, the Commission has decided to set the operator's cap to promote the addition of an average of three channels per year for the next two years. This rate corresponds to six new channels over the next two years. With the seventh added channel in the third year, an operator could collect additional revenue for an average of two and one-third new channels per year over the next three years.

The operator's cap provides flexibility in the timing of channel additions. For example, the cap allows an operator to collect added revenue for up to six new channels in the first year, taking the full per channel adjustment factor on each. Moreover, systems that want to add more than seven channels in the next three years can do so by adding channels to NPTs. Alternatively, systems can add more channels to existing CPSTs by taking less than the full per channel adjustment factor on each channel.

The flexibility provided by the operator's cap is consistent with the experience of systems during the pre-regulation period. On average, between 1986 and 1991, 71.6 % of systems added six or fewer channels during any two-year interval. On average during the same period, 61.4 % of systems added seven or fewer channels during any three-year interval. Based on the historical evidence, we believe that the operator's cap will not impose an unreasonable restriction on channel additions to CPSTs over the next three years.

### **3. THE LICENSE FEE RESERVE**

The license fee reserve is the final component of the cap structure that we estimated. At the same time that it protects consumers, the reserve must be set high enough to allow for programming costs associated with new channels added.

As with the operator's cap, our choice of the value of the license fee reserve was informed by determining an appropriate per channel allowance and then multiplying this amount by a rate of channel additions that reflects the historical pattern. Given our earlier estimate of the historical rate of channel additions, our focus in this section is on the estimate of an appropriate allowance per new channel added.

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<sup>33</sup> This lumpiness may reflect the cable systems' need to introduce multiple packages of services in order to build customer loyalty for any one package, and/or economies of scope associated with investment and maintenance costs at the headend.

The first step in establishing the license fee reserve was to estimate license fees that operators historically incurred when they added channels to their systems. Conceptually, one wants to calculate the average license fee per subscriber for each channel added.

We used two types of data to approximate the average license fee incurred per added channel. The first type included license fee expenditures for all programming, both new and old. We used two data sets: basic plus compulsory license fee expenditures and "average" license fee.<sup>34</sup> We used these data to calculate the change in inflation-adjusted license fee

expenditures per channel added between 1986 and 1991.<sup>35</sup> This calculation provided an upper bound because we were unable to exclude increases in license fee expenditures caused by price increases for programs already on cable systems. Our upper bound estimate is 12.9 cents.<sup>36</sup>

The second type of data contained the license fees for each new channel in the first year that the channel was introduced commercially. The data set includes all seven channels that were introduced commercially between 1985 and 1991. We used these data to calculate the average license fee (adjusted for inflation) per subscriber.<sup>37</sup>

By focusing only on the license fees associated with newly introduced services, we excluded license fee increases associated with channels already on some cable systems. In addition, we could better account for programmers' practice of discounting license fees in the year that a new service was introduced. Table 6 shows that the average of first-year license fees between 1985 and 1991 is 3.7 cents.

The 3.7 cent estimate is a lower bound because it excludes programs that are new to the system but not to the industry. In addition to adding newly launched programming services, systems add new channels for programming services that are not new to the industry.

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<sup>34</sup> The section on the Adjustment for Programming Costs contains sources and methods used to estimate programming costs.

<sup>35</sup> Mathematically, this is expressed as follows:  $\frac{(LF_2 - LF_1)}{(N_2 - N_1)}$ , where

LF<sub>2</sub> = Total industry license fee expenditures in 1991

LF<sub>1</sub> = Total industry license fee expenditures in 1986

N<sub>2</sub> = Subscriber weighted total channels in 1991

N<sub>1</sub> = Subscriber weighted total channels in 1986

<sup>36</sup> This upper bound estimate is the average of the two programming cost methods discussed in the section entitled Adjustment for Program Costs.

<sup>37</sup> This estimate is single-weighted by subscribers across cable systems.

The license fee reserve is intended to encourage systems to add new programming, including programming already on other systems. Since previously launched cable programming services may already be commercially successful on other systems, they are likely to be higher priced than the newly launched programming. Therefore, the 3.7 estimate is our lower bound for new programming costs. In sum, the two types of data provide a lower and an upper bound for the change in license fees per channel added. Our estimate of the lower bound is 3.7 cents. Our estimate of the upper bound is 12.9 cents.

Based on the policies we adopt in the Order and our analysis of the data, we believe that a 30 cent license fee reserve will encourage operators to add new channels, while at the same time protecting subscribers from excessive rate increases. First, if operators add six new channels in the next two years, the license fee reserve alone will provide an *average* programming allowance of 5 cents per channel. This 5 cent allowance lies within our upper and lower-bound estimates of historical programming costs. Second, operators may use part of the operator's cap to pay programming costs. Third, our rules permit operators to add programming to NPTs, which are not subject to a rate cap. Finally, the license fee reserve will be in effect for only two years. In the third and subsequent years, new programming will be subject only to the Commission's general rate rules. Thus, new programming can be priced low to gain acceptance in the first two years and then priced higher to reflect its increased popularity in later years.

**Table 1**  
**Summary of Data and Adjustments for various Estimates of the Per Channel Adjustment Factor**

Study	Channel Adjustment Factor	Time Period	Dataset (Sample Size)	Service Definition	Channel Definition *	Inflation Index	Weighting Scheme	Market Power Adjustment (MPA) **
TCI (1)	\$0.21	1986-1991	GAO survey (1,500 operators)	Most popular service tier. Unknown mix of basic and extended basic	Total channels	CPI	Single Channels and rates weighted by subscribers across operators	Same-cost method. .83 adjustment factor
TCI (2)	\$0.30	1986-1992	FCC survey (500, non-competitive operators)	All regulated services	Total channels	CPI	Single Channels and rates weighted by subscribers across tiers	Same-cost method. .83 adjustment factor
NCTA	\$0.30 - \$0.77	1986-1992	FCC survey (17 municipal and overbuild operators)	All regulated services	Total channels	GNP-PI	No weighting	Implicit in selection of "competitive" sample.
CSB	\$0.20	1986-1991	Television and Cable Factbook (500 operators)	All regulated services	Total channels	GDP-PI	Double***	Same-cost method. .83 adjustment factor

\* TCI also calculated the channel adjustment factor using an estimate of satellite channels. We do not report these findings since the non-programming costs of adding a channel are similar for satellite and total channels.

\*\* TCI adjusted for the effects of market power by two methods. The method presented in this table (same-cost method) involves multiplying the monthly subscriber rate, excluding programming costs by .83. The other method (lower-cost method) involves multiplying both subscriber rates and programming costs by .83. We reject this estimate because it rests on the implausible assumption that programmers can extract a significant share of cable operators' profits.

\*\*\* Channels and rates weighted first by subscribers across tiers and then by subscribers across operators.

**Table 2**  
**Composition of the Sample Used in the Cable Services Bureau Study**

<b>System Size (Basic Subscribers in 1991)</b>	<b>Number of Cable Systems</b>	<b>Percentage of the Sample</b>
50, 000 +	173	31.92%
20,000 to 49,999	131	24.17%
10,000 to 19,999	71	13.10%
5,000 to 9,999	52	9.59%
3,500 to 4,999	21	3.87%
1,000 to 3,499	53	9.78%
500 to 999	18	3.32%
250 to 499	10	1.85%
Less Than 250	4	0.74%
No Basic Subscriber Data For 1991	9	1.66%
<b>Total</b>	<b>542</b>	<b>100%</b>

Source: Warren Publishing, Inc., Television & Cable Factbook, Cable & Services  
Volume No. 59 (Cable-Part i), 1991.

**Table 3**  
**Per Channel Adjustment Factor Estimation: 1986 - 1991**  
**Double Weighting Method**

Programming Cost Measure		Change in Rate Per Change in Number of Total Channels (\$1994)	Change in Programming Costs Per Change in Number of Total Channels (\$1994)	Per Channel Adjustment Factor (\$1994)
		(1)	(2)	(3)
Compulsory Plus Basic License Fee	(1)	0.332	0.113	0.219
Average License Fee	(2)	0.332	0.145	0.187

**Notes:**

Column (1): Change in monthly rates per additional channel.

Column (2): Change in monthly programming costs per additional channel.

Column (3): Change in rates per channel minus change in programming costs per channel = Per Channel Adjustment Factor.

Row (1): Calculated using the difference between 1986 and 1991 data. Programming costs defined as license fee expenses plus compulsory broadcast retransmission charges (For derivation of numbers, see Table 4).

Row (2): Calculated using the difference between 1986 and 1991 data, with average per subscriber programming cost data (For derivation of numbers, see Table 5).



**Table 4**  
**Compulsory Plus Basic License Fee Programming Cost Data**  
**Double Weighting**

Year	Nominal Rate	GDP-PI	Real (\$1994) Rate	Real (\$1994) Rate Adjusted for Competitive Differential	Programming Costs (\$1994)	Total Channels	Change in Real (\$1994) Rate Per Change in Total Channels	Change in Programming Costs (\$1994) Per Change in Total Channels	Per Channel Adjustment Factor (\$1994)
	(1)	(2)	Column1 x Column2 (3)	Column3 x (1 - .17) (4)	(5)	(6)	Column4 / Column6 (7)	Column5 / Column6 (8)	Column7 - Column8 (9)
1986	\$10.57	1.295	\$13.68	\$11.36	\$0.98	28.28			
1991	\$17.49	1.066	\$18.64	\$15.47	\$2.39	40.67			
1986-1991 Change				\$4.12	\$1.41	12.39	0.332	0.113	0.219

Notes:

Column (1): Monthly rates weighted by subscribers across tiers and by subscribers across operators.

Column (2): Gross Domestic Product Price Index, rebased to 1994 equals 100.

Column (3): Monthly rates adjusted for inflation using GDP-PI.

Column (4): Real monthly rates adjusted for market power by multiplying by the FCC competitive differential (1 - .17).

Column (5): Compulsory broadcast retransmission charges plus license fee expenses per subscriber per month.

Column (6): Number of total channels weighted by subscribers across tiers and by subscribers across operators.

Column (7): Increase in real, competitive rates per additional channel.

Column (8): Increase in programming costs per additional channel.

Column (9): Increase in rates per channel minus increase in programming costs per channel = Per Channel Adjustment Factor.

Sources:

Columns (1) and (6): FCC sample of 500 randomly selected cable firms with data from the Television and Cable Factbook, Warren Publishing, Inc., 1986-1991 editions.

Column (2): United States Department of Commerce, Bureau of Economic Analysis.

Column (5): Cable TV Programming, Paul Kagan Associates, Inc., April 1993; The Cable and Satellite Carrier Compulsory License Fees: An Overview Analysis, The Register of Copyrights, United States Copyright Office, March 1992, Appendix C, Table 2.